HL 030802

IB/2004/050969

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Patentanmeldung Nr. Patent application No. Demande de brevet n°

03101874.0 ✓

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
p.o.

R C van Dijk

Anmeldung Nr:
Application no.: 03101874.0
Demande no:

Anmeldetag:
Date of filing: 25.06.03
Date de dépôt:

Anmelder/Applicant(s)/Demandeur(s):

Koninklijke Philips Electronics N.V.
Groenewoudseweg 1
5621 BA Eindhoven
PAYS-BAS

Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
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Stabilizing device, fluorescent lamp comprising such a device and method for strengthening a fluorescent lamp

In Anspruch genommene Priorität(en) / Priority(ies) claimed /Priorité(s) revendiquée(s)
Staat/Tag/Aktenzeichen/State/Date/File no./Pays/Date/Numéro de dépôt:

Internationale Patentklassifikation/International Patent Classification/ Classification internationale des brevets:

H01J61/00

Am Anmeldetag benannte Vertragstaaten/Contracting states designated at date of filing/Etats contractants désignées lors du dépôt:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR LI

Stabilizing device, fluorescent lamp comprising such a device and method for strengthening a fluorescent lamp

The present invention relates to a stabilizing device for strengthening a burner part of a fluorescent lamp comprising a number of glass tubes connected by at least one bridge part to form a discharge path through the tubes between two electrodes each provided in one on the tubes. The invention further relates to a fluorescent lamp with a burner part comprising a number of glass tubes connected by at least one bridge part to form a discharge path through the tubes between two electrodes each provided in one on the tubes and a method for strengthening the burner part of such a fluorescent lamp.

Fluorescent lamps comprising a number of glass tubes connected by bridges are generally known and in the market sold as for instance PL and SL lamps. Normally, but not exclusively, these lamps comprise an even number (e.g. 2, 4, 6 or 8) of substantially parallel glass tubes (legs) connected by bridge portions. The glass tube assembly, including normally two electrodes, is assembled with a base comprising electrode terminals for supplying electric power to the electrodes. To make these fluorescent lamps mechanically less vulnerable it is a know technique to apply silicone dots in between the legs however these silicone dots do not improve the strength sufficiently and the strength provided by the silicon dots is not fully controlled. Furthermore the application of silicon dots is not desired as of esthetical disadvantages

The object of the invention is to provide means to improve the strength of fluorescent lamps for which the above-mentioned drawbacks do not arise. The object of the invention is also to provide an improved fluorescent lamp and an easy method for production of such an improved fluorescent lamp.

This object is achieved in accordance with the invention with a stabilizing device for strengthening a burner part of a fluorescent lamp comprising a number of glass tubes connected by at least one bridge part to form a discharge path through the tubes between two electrodes each provided in one on the tubes, characterized in that the

stabilizing device comprises at least one plastic holder provided with at least two separate contact surfaces shaped to fit the burner part of the fluorescent lamp at at least two separate locations. Due to the stabilizing device the relative position of the glass tubes is supported. This effect is especially sought for during applied load of the burner part (e.g. during transport or during insertion of removal of the fluorescent lamp in/from a socket. This effect is even more appreciated as the use of longer lamps (longer burner lengths) is developing. The use of a plastic holder makes that the process of stabilizing the legs can be controlled as the dimensions of the stabilizing device are fully controllable. Also the esthetical effect of the stabilizing element is controllable; color (e.g. transparency) and shape are dependant from the plastic holder. Preferably at least one of the contact surfaces forms a housing for receiving a burner part, the housing having an aperture to give the burner part access to the housing, which opening has a width that is smaller than a maximum clearance provided in the housing. Such a housing has normally a three-dimensional shape to provide a dimensionally stable grip on the burner part. The advantage of a form fit coupling is that the connection can be provided without providing a continuous pre-load on the burner part, thus reducing the risk of damage on the burner part due to the stabilizing device. In another embodiment the stabilizing device comprises at least one bumper part that projects from the stabilizing part so that, when installed on the burner part, the bumper part thus enables the absorption of loads that could damage the burner part of the lamp.

The stabilizing device can be made of a flexible material and the contact surface forms a housing to snap-fit on a burner part. An easy and cheap solution is the use of an ejection moulded plastic part, e.g. moulded from polybutylene-terephthalate. However the stabilizing device can also be made from a rigid material not providing the option of a snap-fit but to be coupled by manipulation with the stabilizing device (e.g. rotation or linear placement in line with the axis of the glass tubes).

An extra functionality can be provided to a fluorescent lamp by providing the stabilizing device also of a light-influencing device, such as e.g. a mirror, a filter, a transparent material and/or a lens. For instance providing a stabilizing device with a mirror enables the construction of an upward or downward reflecting fluorescent lamp without the need of mirrors in the fitting (luminaire). This embodiment enables also the provision of a transparent masking (covering) to prevent direct sight on the fluorescent lamp. The coupling of a light-influencing device can easily be realized in combination with the assembly of the lamp and the stabilizing device so does not require an extra handling. Furthermore the coupling of the fluorescent lamp and the light-influencing device can be provided without

damage on the lamp. Instead of or in combination with light influencing means the stabilizing device can also be combined with means to improve the ignition of the lamp c.q. to lower the ignition voltage favorable for the ballast.

The present invention also provides a fluorescent lamp with a burner part comprising a number of glass tubes connected by at least one bridge part to form a discharge path through the tubes between two electrodes each provided in one on the tubes, characterized in that the fluorescent lamp also comprises a stabilizing device as disclosed above, the stabilizing device being dimensionally stable connected to the burner part of the fluorescent lamp thus stabilizing the burner part. Preferably the stabilizing device is dimensionally stable connected to the burner part of the fluorescent lamp without exerting a pre-load on the burner part; that is not exerting a pre-load in normal circumstances of use. Such normal circumstances are defined as circumstances in which the burner part is not mechanically loaded. The stabilizing device is preferably located on the burner part opposite to the side of the burner part connected to a lamp base as its stabilizing function is best performed at this relatively weak location of the burner part. It is also possible to provide a fluorescent lamp with more than one stabilizing device, as well as providing the fluorescent lamp with a stabilizing device carrying a light-influencing device. For further advantages of these lamps according the present invention reference is made to the above-identified advantages in relation to the stabilizing device according the invention.

Furthermore the invention also provides a method for strengthening a burner part of a fluorescent lamp comprising a number of glass tubes connected by respective bridge parts to form a discharge path through the tubes between two electrodes each provided in one on the tubes, characterized in that after the burner part of the fluorescent lamp is produced by connecting a number of glass tubes with at least one bridge part the bridge part is provided with a stabilizing device as disclosed above. Preferably the stabilizing device is connected to the burner part of the fluorescent lamp by a snap connection. Such a method is no hindrance to the already used production method of fluorescent lamps according the prior art. The stabilizing device (or devices) can be coupled to the fluorescent lamp after the well-known production of the lamps is finished. If desired the stabilizing device can also be removed from a fluorescent lamp for instance after a period with high risk (e.g. transport) is terminated. The removed stabilizing device can later be re-used for stabilizing the same or another florescent lamp.

The invention will now be described with reference to the non-limitative embodiments shown in the accompanying drawing. Herein:

Figure 1 a perspective view on a stabilizing device according the present invention;

Figure 2A longitudinal cross-section of a fluorescent lamp comprising the stabilizing device shown in figure 1;

Figure 2B horizontal cross-section of the lamp shown in figure 2A;

Figure 3 a perspective view of the lamp shown in the figures 2A and 2B;

Figure 4 a perspective view on a second alternative embodiment of a stabilizing device according the present invention; and

Figure 5 a perspective view on a third alternative embodiment of a stabilizing device according the present invention.

Figure 1 shows a stabilizing device 1 comprising two differently shaped types of contact surfaces 2 and 3. The first type of contact surfaces 2 is provided in triplicate and is designed to fit the bridge parts of fluorescent lamps; this will be shown in the figures 2 and 3. The device 1 also has six second type of contact surfaces 3, designed to fit the glass tubes of fluorescent lamps; this also will be shown in the figures 2 and 3.

Figures 2A and 2B show the device 1 in an assembled position with a fluorescent lamp 4. The fluorescent lamp 4 has parallel glass tubes 5 that are coupled with bridge parts 6 to form a discharge path through the tubes 5. On one side the tubes 5 are housed in a base 7 comprising electrode terminals 8 for supplying electric power to the, in these figures non visible, electrodes in the tubes 5. The device 1 both contacts the bridge parts 6 and the tubes 5 thus stabilizing the assembly of the tubes 5 also indicated as a burner part 9. The same device 1 and fluorescent lamp 4 are also shown in figure 3. In this figure 3 can be recognized that the first type of contact surfaces 2 contacts the bridge parts 6 of the fluorescent lamp 4 while the second type of contact surfaces 3 contacts the tubes 5.

Figure 4 shows a stabilizing device 10 provided with two pairs of contact surfaces 11, each pair of contact surfaces 11 to be places in between opposing glass tubes of a fluorescent lamp. The stabilizing device 10 has to opposite protruding end parts 12 that can function as bumpers when the stabilizing device is coupled to a lamp.

Finally figure 5 shows a stabilizing device 13 that corresponds partially with the stabilizing device 10 as shown in figure 4 except the shielding element 14 that is provided extra.

CLAIMS:

1. Stabilizing device (1, 10, 13) for strengthening a burner part (9) of a fluorescent lamp (4) comprising a number of glass tubes (5) connected by at least one bridge part (6) to form a discharge path through the tubes (5) between two electrodes each provided in one on the tubes (5), characterized in that the stabilizing device (1, 10, 13) comprises at least one plastic holder provided with at least two separate contact surfaces (2, 3, 11) shaped to fit the burner part (9) of the fluorescent lamp (4) at at least two separate locations.

2. Stabilizing device (1, 10, 13) according claim 1, characterized in that at least one of the contact surfaces (2, 3, 11) forms a housing for receiving a burner part (9), the housing having an aperture to give the burner part (9) access to the housing, which opening has a width that is smaller than a maximum clearance provided in the housing.

3. Stabilizing device (1, 10, 13) according claim 1 or 2, characterized in that the stabilizing device (1, 10, 13) is made of a flexible material and the contact surface (2, 3, 11) forms a housing to snap-fit on a burner part (9).

4. Stabilizing device (1, 10, 13) according one of the preceding claims, characterized in that the stabilizing device (1, 10, 13) comprises at least one bumper part (12) that projects from the stabilizing device (1, 10, 13).

5. Stabilizing device (1, 10, 13) according one of the preceding claims, characterized in that the stabilizing device (1, 10, 13) is an ejection moulded plastic part.

6. Stabilizing device (1, 10, 13) according one of the preceding claims, characterized in that the stabilizing device (1, 10, 13) also comprises a light-influencing device (14).

7. Fluorescent lamp (4) with a burner part (9) comprising a number of glass tubes (5) connected by at least one bridge part (6) to form a discharge path through the tubes (5)

between two electrodes each provided in one on the tubes (5), characterized in that the fluorescent lamp (4) also comprises a stabilizing device (1, 10, 13) according one of the previous claims, the stabilizing device (1, 10, 13) being dimensionally stable connected to the burner part (9) of the fluorescent lamp (4) thus stabilizing the burner part (9).

8. Fluorescent lamp (4) according claim 7, characterized in that the stabilizing device (1, 10, 13) being dimensionally stable connected to the burner part (9) of the fluorescent lamp (4) without exerting a pre-load on the burner part (9).

9. Fluorescent lamp (4) according claim 7 or 8, characterized in that the stabilizing device (1, 10, 13) is located on the burner part (9) opposite to the side of the burner part (9) connected to a lamp base (7).

10. Fluorescent lamp (4) according one of the claims 7 - 9, characterized in that the fluorescent lamp (4) is provided with at least two stabilizing devices (1, 10, 13) according one of the claims 1 – 6.

11. Fluorescent lamp (4) according one of the claims 7 - 10, characterized in that the fluorescent lamp (4) is provided with a stabilizing device (1, 10, 13) carrying a light influencing device (14).

12. Method for strengthening a burner part (9) of a fluorescent lamp (4) comprising a number of glass tubes (5) connected by respective bridge parts (6) to form a discharge path through the tubes (5) between two electrodes each provided in one on the tubes (5), characterized in that after the burner part (9) of the fluorescent lamp (4) is produced by connecting a number of glass tubes (5) with at least one bridge part (6) the bridge part (6) is provided with a stabilizing device (1, 10, 13) according one of the claims 1 - 6.

13. Method according claim 12, characterized in that the stabilizing device (1, 10, 13) is connected to the burner part (9) of the fluorescent lamp (4) by a snap connection.

ABSTRACT:

The invention provides a stabilizing device for strengthening a burner part of a fluorescent lamp comprising a number of glass tubes connected by at least one bridge part, characterized in that the stabilizing device comprises at least one plastic holder provided with at least two separate contact surfaces shaped to fit the burner part of the fluorescent lamp at at least two separate locations.

The invention also provides a fluorescent lamp comprising such a stabilizing device and a method for strengthening a burner part of a fluorescent lamp.

Fig. 1

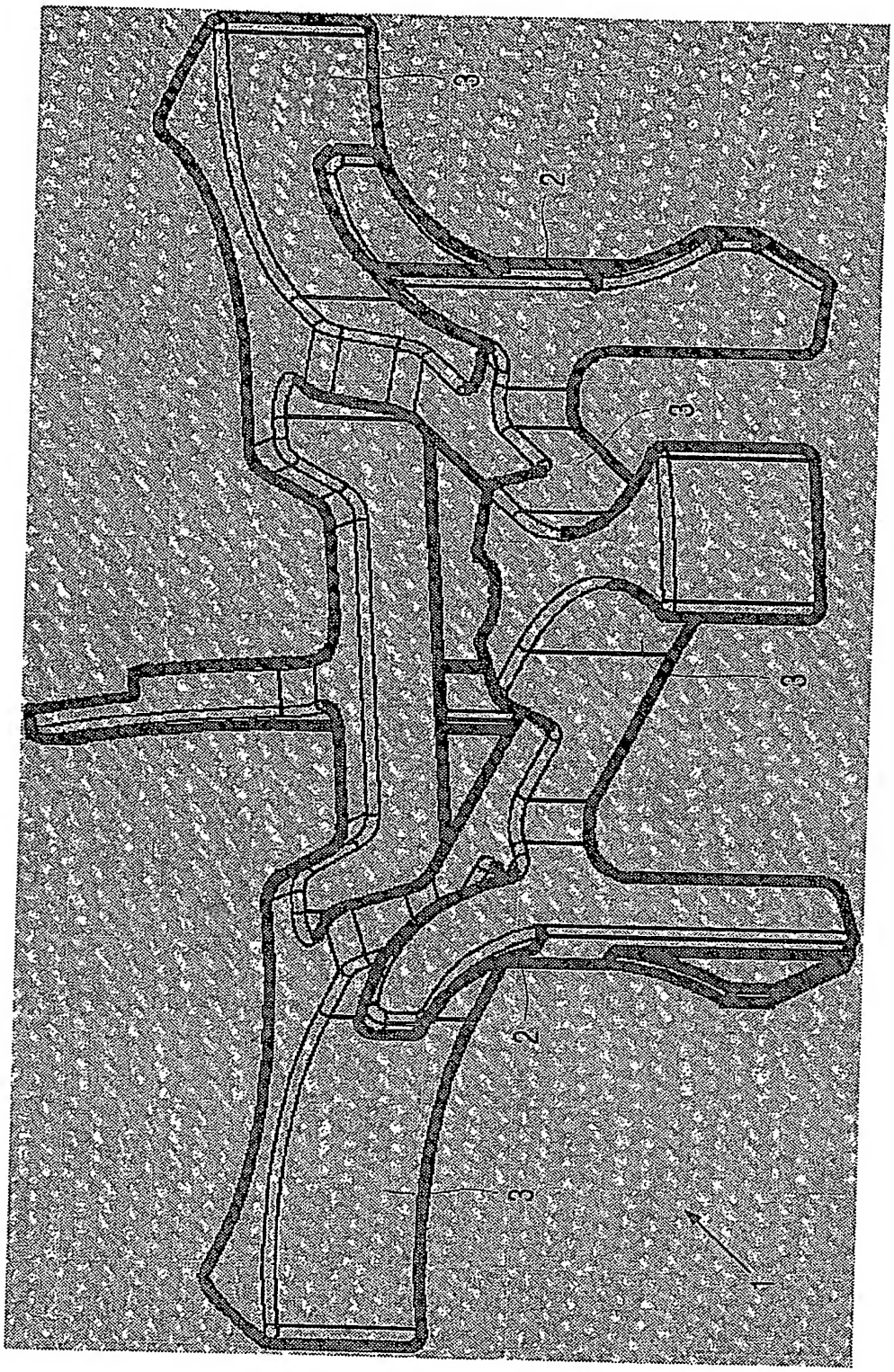

FIG.1

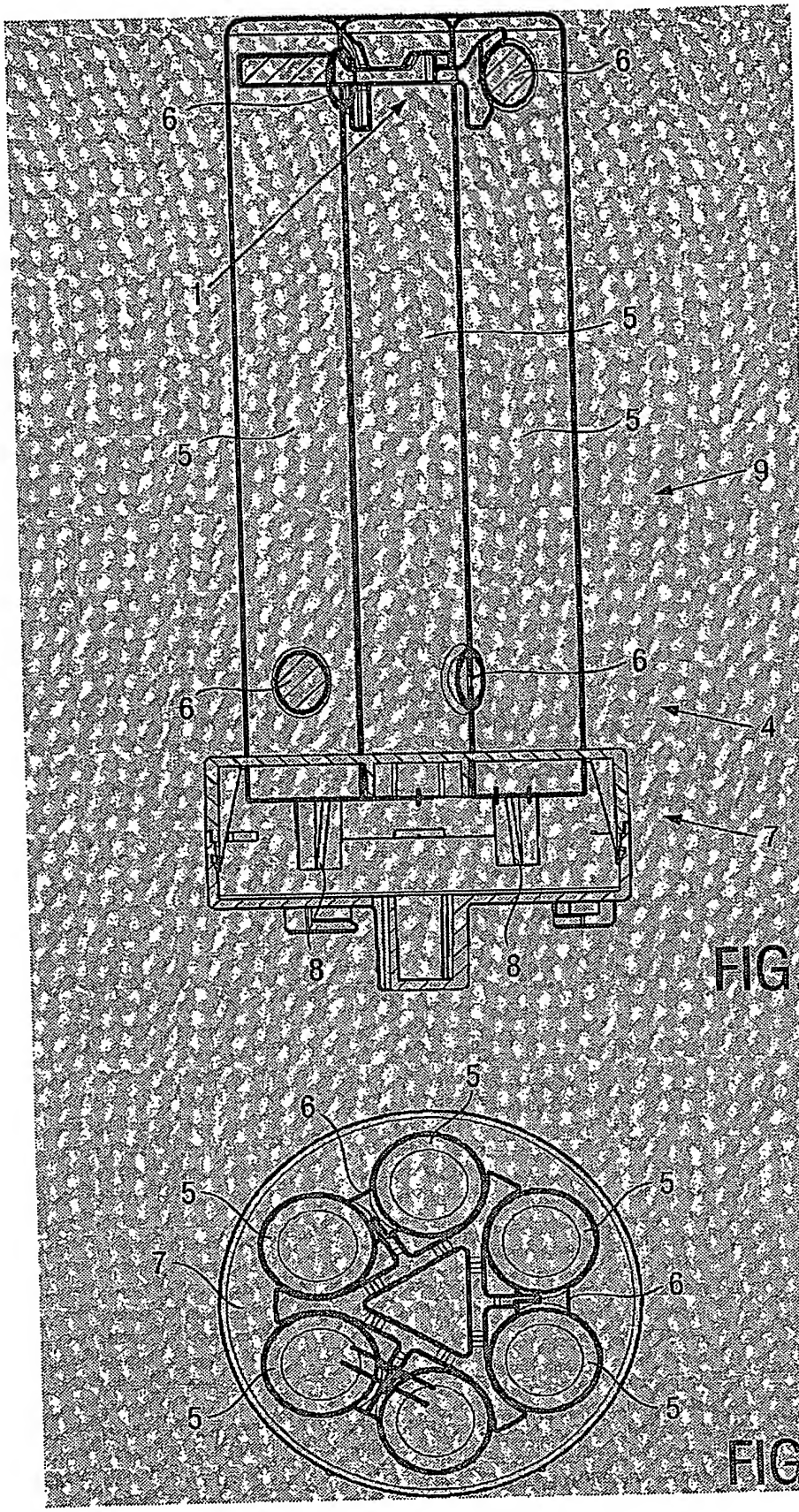

FIG.2A

FIG.2B

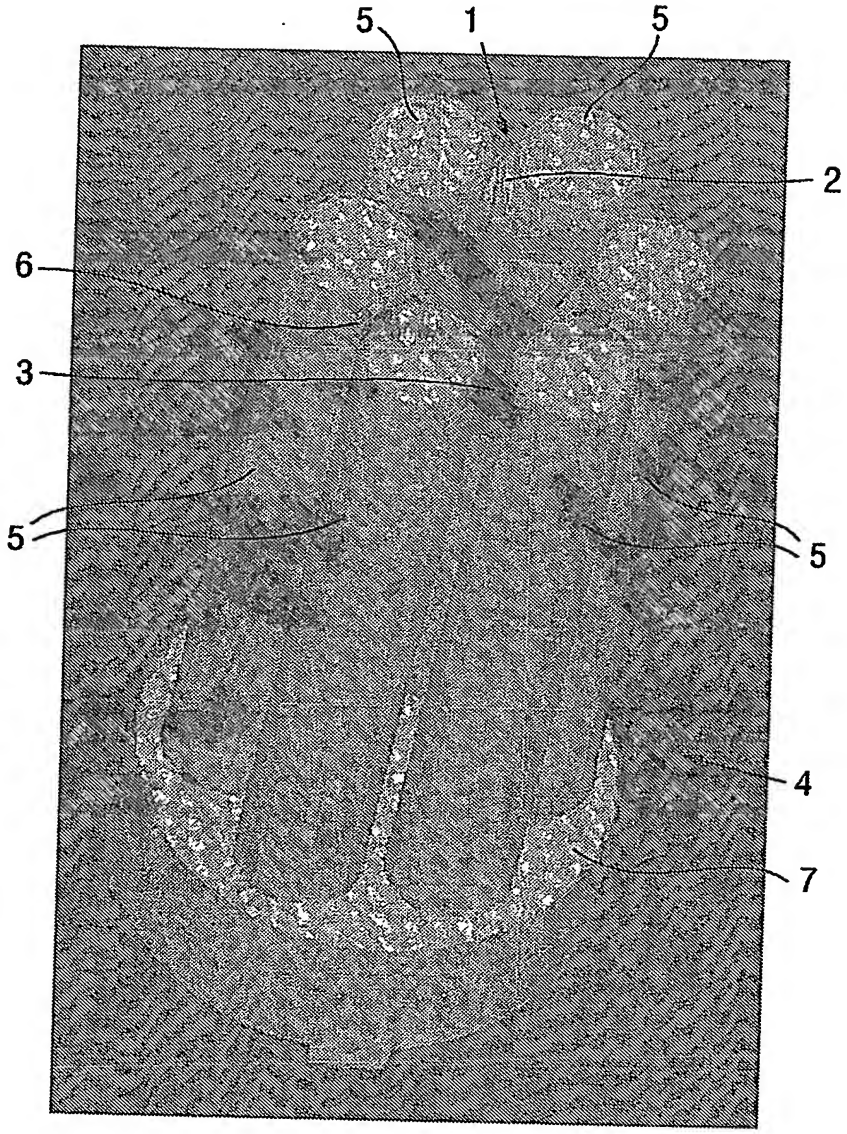

FIG.3

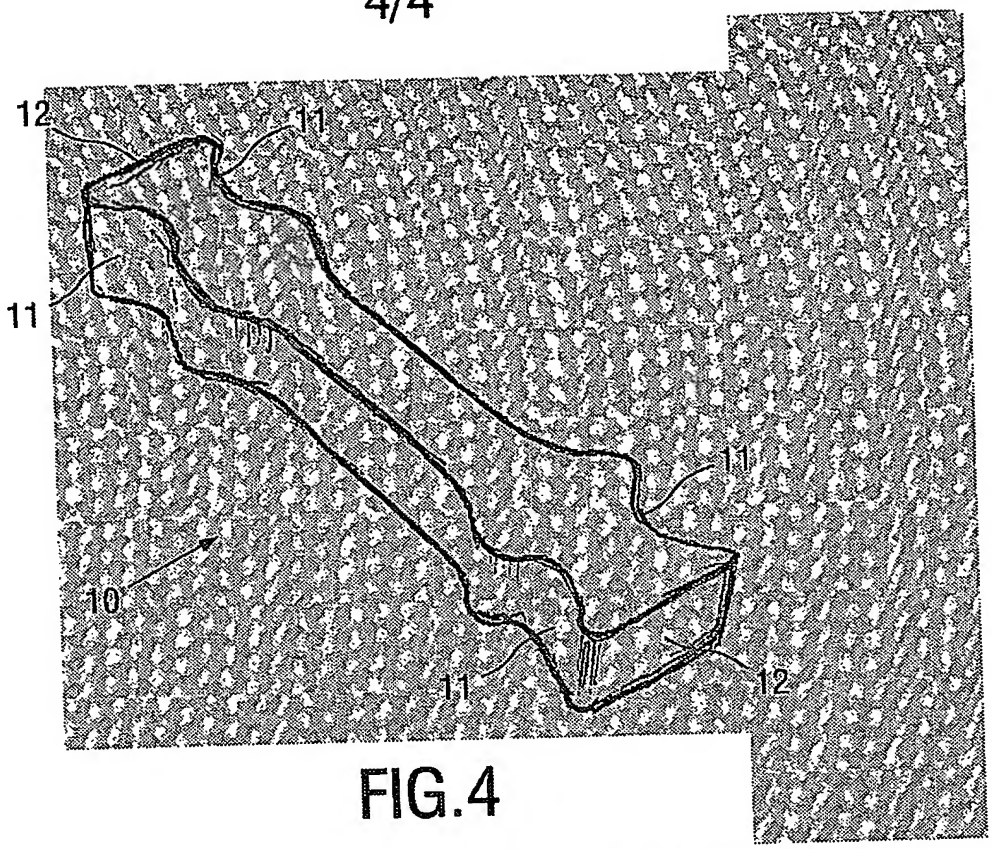

FIG.4

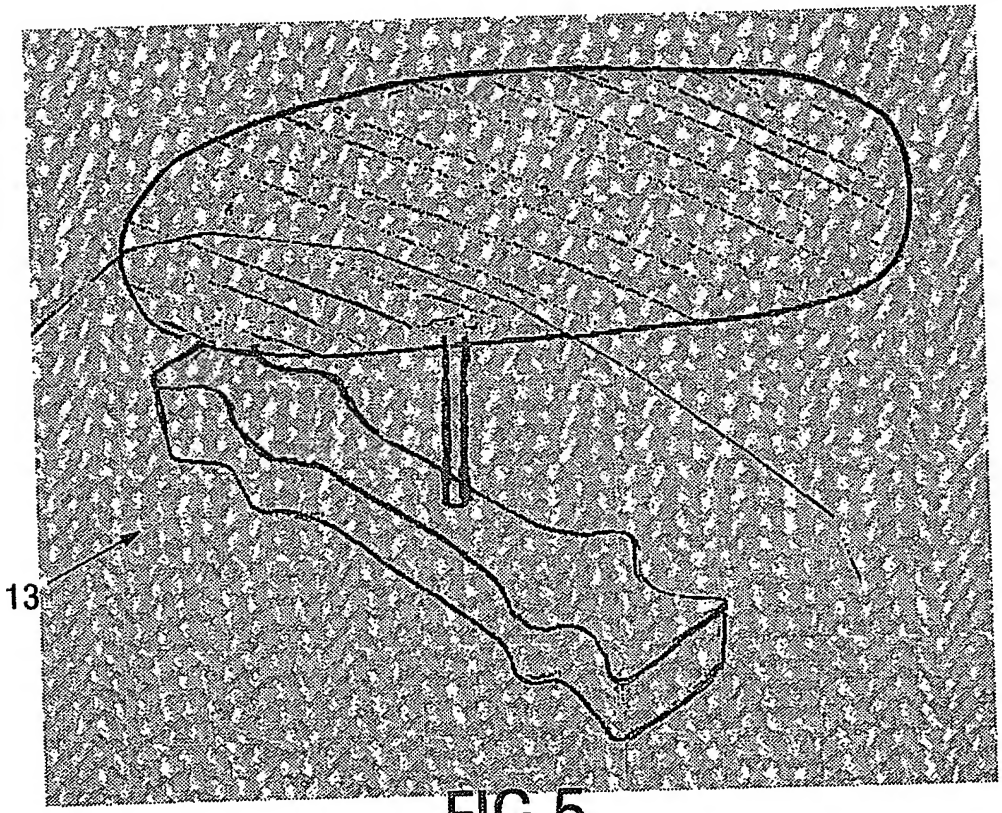

FIG.5